

Appendix B

Glossary

Air Sparging In air sparging, air is injected into the ground below a contaminated area, forming bubbles that rise and carry trapped and dissolved contaminants to the surface where they are captured by a soil vapor extraction system. Air sparging may be a good choice of treatment technology at sites contaminated with solvents and other volatile organic compounds (VOCs). See also Volatile Organic Compound.

Air Stripping Air stripping is a treatment method that removes or "strips" VOCs from contaminated groundwater or surface water as air is forced through the water, causing the compounds to evaporate. See also Volatile Organic Compound.

American Society for Testing and Materials (ASTM) The ASTM sets standards for many services, including methods of sampling and testing of hazardous waste, and media contaminated with hazardous waste.

Aquifer An aquifer is an underground rock formation composed of such materials as sand, soil, or gravel that can store groundwater and supply it to wells and springs.

Aromatics Aromatics are organic compounds that contain 6-carbon ring structures, such as creosote, toluene, and phenol, that often are found at dry cleaning and electronic assembly sites.

Baseline Risk Assessment A baseline risk assessment is an assessment conducted before cleanup activities begin at a site to identify and evaluate the threat to human health and the environment. After cleanup has been completed, the information obtained during a baseline risk assessment can be used to determine whether the cleanup levels were reached.

Bedrock Bedrock is the rock that underlies the soil; it can be permeable or non-permeable. See also Confining Layer and Creosote.

Bioremediation Bioremediation refers to treatment processes that use microorganisms (usually naturally occurring) such as bacteria, yeast, or fungi to break down hazardous substances into less toxic or nontoxic substances. Bioremediation can be used to clean up contaminated soil and water. In situ bioremediation treats the contaminated soil or groundwater in the location in which it is found. For ex situ bioremediation processes, contaminated soil must be excavated or groundwater pumped before they can be treated.

Bioventing Bioventing is an in situ cleanup technology that combines soil vapor extraction methods with bioremediation. It uses vapor extraction wells that induce air flow in the subsurface through air injection or through the use of a

vacuum. Bioventing can be effective in cleaning up releases of petroleum products, such as gasoline, jet fuels, kerosene, and diesel fuel. See also Bioremediation.

Borehole A borehole is a hole cut into the ground by means of a drilling rig.

Borehole Geophysics Borehole geophysics are nuclear or electric technologies used to identify the physical characteristics of geologic formations that are intersected by a borehole.

Brownfields Brownfields sites are abandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.

BTEX BTEX is the term used for benzene, toluene, ethylbenzene, and xylene--volatile aromatic compounds typically found in petroleum products, such as gasoline and diesel fuel.

Cadmium Cadmium is a heavy metal that accumulates in the environment. See also Heavy Metal.

Carbon Adsorption Carbon adsorption is a treatment method that removes contaminants from groundwater or surface water as the water is forced through tanks containing activated carbon.

Chemical Dehalogenation Chemical dehalogenation is a chemical process that removes halogens (usually chlorine) from a chemical contaminant, rendering the contaminant less hazardous. The chemical dehalogenation process can be applied to common halogenated contaminants such as polychlorinated biphenyls (PCBs), dioxins (DDT), and certain chlorinated pesticides, which may be present in soil and oils. The treatment time is short, energy requirements are moderate, and operation and maintenance costs are relatively low. This technology can be brought to the site, eliminating the need to transport hazardous wastes. See also Polychlorinated Biphenyl.

Cleanup Cleanup is the term used for actions taken to deal with a release or threat of release of a hazardous substance that could affect humans and/or environment.

Colorimetric Colorimetric refers to chemical reaction-based indicators that are used to produce compound reactions to individual compounds, or classes of compounds. The reactions, such as visible color changes or other easily noted indications, are used to detect and quantify contaminants.

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) CERCLIS is a database that serves as the official inventory of Superfund hazardous waste sites. CERCLIS also contains information about all aspects of hazardous waste sites, from initial discovery to deletion from the National Priorities List (NPL). The database also maintains information about planned and actual site activities and financial information entered by EPA regional offices. CERCLIS records the targets and accomplishments of the Superfund program and is used to report that information to the EPA Administrator, Congress, and the public. See also National Priorities List and Superfund.

Confining Layer A confining layer is a geological formation characterized by low permeability that inhibits the flow of water. See also Bedrock and Permeability.

Contaminant A contaminant is any physical, chemical, biological, or radiological substance or matter present in any media at concentrations that may result in adverse effects on air, water, or soil.

Data Quality Objective (DQO) DQOs are qualitative and quantitative statements specified to ensure that data of known and appropriate quality are obtained. The DQO process is a series of planning steps, typically conducted during site assessment and investigation, that is designed to ensure that the type, quantity, and quality of environmental data used in decision-making are appropriate. The DQO process involves a logical, step-by-step procedure for determining which of the complex issues affecting a site are the most relevant to planning a site investigation before any data are collected.

Disposal Disposal is the final placement or destruction of toxic, radioactive or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous materials from removal actions or accidental release. Disposal may be accomplished through the use of approved secure landfills, surface impoundments, land farming, deep well injection, ocean dumping, or incineration.

Dual-Phase Extraction Dual-phase extraction is a technology that extracts contaminants simultaneously from soils in saturated and unsaturated zones by applying soil vapor extraction techniques to contaminants trapped in saturated zone soils.

Electromagnetic (EM) Geophysics EM geophysics refers to technologies used to detect spatial (lateral and vertical) differences in subsurface electromagnetic characteristics. The data collected provide information about subsurface environments.

Electromagnetic (EM) Induction EM induction is a geophysical technology used to induce a magnetic field beneath the earth's surface, which in turn causes a secondary magnetic field to form around nearby objects that have

conductive properties, such as ferrous and nonferrous metals. The secondary magnetic field is then used to detect and measure buried debris.

Emergency Removal An emergency removal is an action initiated in response to a release of a hazardous substance that requires on-site activity within hours of a determination that action is appropriate.

Emerging Technology An emerging technology is an innovative technology that currently is undergoing bench-scale testing. During bench-scale testing, a small version of the technology is built and tested in a laboratory. If the technology is successful during bench-scale testing, it is demonstrated on a small scale at field sites. If the technology is successful at the field demonstrations, it often will be used full scale at contaminated waste sites. The technology is continually improved as it is used and evaluated at different sites. See also Established Technology and Innovative Technology.

Engineered Control An engineered control, such as barriers placed between contamination and the rest of a site, is a method of managing environmental and health risks. Engineered controls can be used to limit exposure pathways.

Established Technology An established technology is a technology for which cost and performance information is readily available. Only after a technology has been used at many different sites and the results fully documented is that technology considered established. The most frequently used established technologies are incineration, solidification and stabilization, and pump-and-treat technologies for groundwater. See also Emerging Technology and Innovative Technology.

Exposure Pathway An exposure pathway is the route of contaminants from the source of contamination to potential contact with a medium (air, soil, surface water, or groundwater) that represents a potential threat to human health or the environment. Determining whether exposure pathways exist is an essential step in conducting a baseline risk assessment. See also Baseline Risk Assessment.

Ex Situ The term ex situ or "moved from its original place," means excavated or removed.

Filtration Filtration is a treatment process that removes solid matter from water by passing the water through a porous medium, such as sand or a manufactured filter.

Flame Ionization Detector (FID) An FID is an instrument often used in conjunction with gas chromatography to measure the change of signal as analytes are ionized by a hydrogen-air flame. It also is used to detect phenols, phthalates, polyaromatic hydrocarbons (PAH), VOCs, and petroleum hydrocarbons. See also Polyaromatic Hydrocarbons and Volatile Organic Compounds.

Fourier Transform Infrared Spectroscopy A Fourier transform infrared spectroscope is an analytical air monitoring tool that uses a laser system chemically to identify contaminants.

Fumigant A fumigant is a pesticide that is vaporized to kill pests. They often are used in buildings and greenhouses.

Furan Furan is a colorless, volatile liquid compound used in the synthesis of organic compounds, especially nylon.

Gas Chromatography Gas chromatography is a technology used for investigating and assessing soil, water, and soil gas contamination at a site. It is used for the analysis of VOCs and semivolatile organic compounds (SVOC). The technique identifies and quantifies organic compounds on the basis of molecular weight, characteristic fragmentation patterns, and retention time. Recent advances in gas chromatography considered innovative are portable, weather-proof units that have self-contained power supplies.

Ground-Penetrating Radar (GPR) GPR is a technology that emits pulses of electromagnetic energy into the ground to measure its reflection and refraction by subsurface layers and other features, such as buried debris.

Groundwater Groundwater is the water found beneath the earth's surface that fills pores between such materials as sand, soil, or gravel and that often supplies wells and springs. See also Aquifer.

Hazardous Substance A hazardous substance is any material that poses a threat to public health or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive. If a certain quantity of a hazardous substance, as established by EPA, is spilled into the water or otherwise emitted into the environment, the release must be reported. Under certain federal legislation, the term excludes petroleum, crude oil, natural gas, natural gas liquids, or synthetic gas usable for fuel.

Heavy Metal Heavy metal refers to a group of toxic metals including arsenic, chromium, copper, lead, mercury, silver, and zinc. Heavy metals often are present at industrial sites at which operations have included battery recycling and metal plating.

High-Frequency Electromagnetic (EM) Sounding High-frequency EM sounding, the technology used for non-intrusive geophysical exploration, projects high-frequency electromagnetic radiation into subsurface layers to detect the reflection and refraction of the radiation by various layers of soil. Unlike ground-penetrating radar, which uses pulses, the technology uses continuous waves of radiation. See also Ground-Penetrating Radar.

Hydrocarbon A hydrocarbon is an organic compound containing only hydrogen and carbon, often occurring in petroleum, natural gas, and coal.

Hydrogeology Hydrogeology is the study of groundwater, including its origin, occurrence, movement, and quality.

Hydrology Hydrology is the science that deals with the properties, movement, and effects of water found on the earth's surface, in the soil and rocks beneath the surface, and in the atmosphere.

Ignitability Ignitable wastes can create fires under certain conditions. Examples include liquids, such as solvents that readily catch fire, and friction-sensitive substances.

Immunoassay Immunoassay is a technology used to measure compound-specific reactions (generally colorimetric) to individual compounds or classes of compounds. The reactions are used to detect and quantify contaminants. The technology is available in field-portable test kits.

Incineration Incineration is a treatment technology that involves the burning of certain types of solid, liquid, or gaseous materials under controlled conditions to destroy hazardous waste.

Infrared Monitor An infrared monitor is a device used to monitor the heat signature of an object, as well as to sample air. It may be used to detect buried objects in soil.

Inorganic Compound An inorganic compound is a compound that generally does not contain carbon atoms (although carbonate and bicarbonate compounds are notable exceptions), tends to be soluble in water, and tends to react on an ionic rather than on a molecular basis. Examples of inorganic compounds include various acids, potassium hydroxide, and metals.

Innovative Technology An innovative technology is a process that has been tested and used as a treatment for hazardous waste or other contaminated materials, but lacks a long history of full-scale use and information about its cost and how well it works sufficient to support prediction of its performance under a variety of operating conditions. An innovative technology is one that is undergoing pilot-scale treatability studies that are usually conducted in the field or the laboratory; require installation of the technology; and provide performance, cost, and design objectives for the technology. Innovative technologies are being used under many Federal and state cleanup programs to treat hazardous wastes that have been improperly released. For example, innovative technologies are being selected to manage contamination (primarily petroleum) at some leaking underground storage sites. See also Emerging Technology and Established Technology.

In Situ The term *in situ*, "in its original place," or "on-site", means unexcavated and unmoved. *In situ* soil flushing and natural attenuation are examples of *in situ* treatment methods by which contaminated sites are treated without digging up or removing the contaminants.

In Situ Oxidation In situ oxidation is an innovative treatment technology that oxidizes contaminants that are dissolved in groundwater and converts them into insoluble compounds.

In Situ Soil Flushing In situ soil flushing is an innovative treatment technology that floods contaminated soils beneath the ground surface with a solution that moves the contaminants to an area from which they can be removed. The technology requires the drilling of injection and extraction wells on site and reduces the need for excavation, handling, or transportation of hazardous substances. Contaminants considered for treatment by in situ soil flushing include heavy metals (such as lead, copper, and zinc), aromatics, and PCBs. See also Aromatics, Heavy Metal, and Polychlorinated Biphenyl.

In Situ Vitrification In situ vitrification is a soil treatment technology that stabilizes metal and other inorganic contaminants in place at temperatures of approximately 3000• F. Soils and sludges are fused to form a stable glass and crystalline structure with very low leaching characteristics.

Institutional Controls An institutional control is a legal or institutional measure which subjects a property owner to limit activities at or access to a particular property. They are used to ensure protection of human health and the environment, and to expedite property reuse. Fences, posting or warning signs, and zoning and deed restrictions are examples of institutional controls.

Integrated Risk Information System (IRIS) IRIS is an electronic database that contains EPA's latest descriptive and quantitative regulatory information about chemical constituents. Files on chemicals maintained in IRIS contain information related to both non-carcinogenic and carcinogenic health effects.

Landfarming Landfarming is the spreading and incorporation of wastes into the soil to initiate biological treatment.

Landfill A sanitary landfill is a land disposal site for nonhazardous solid wastes at which the waste is spread in layers compacted to the smallest practical volume.

Laser-Induced Fluorescence/Cone Penetrometer Laser-induced fluorescence/cone penetrometer is a field screening method that couples a fiber optic-based chemical sensor system to a cone penetrometer mounted on a truck. The technology can be used for investigating and assessing soil and water contamination.

Lead Lead is a heavy metal that is hazardous to health if breathed or swallowed. Its use in gasoline, paints, and plumbing compounds has been sharply restricted or eliminated by Federal laws and regulations. See also Heavy Metal.

Leaking Underground Storage Tank (LUST) LUST is the acronym for "leaking underground storage tank." See also Underground Storage Tank.

Magnetometry Magnetometry is a geophysical technology used to detect disruptions that metal objects cause in the earth's localized magnetic field.

Mass Spectrometry Mass spectrometry is an analytical process by which molecules are broken into fragments to determine the concentrations and mass/charge ratio of the fragments. Innovative mass spectroscopy units, developed through modification of large laboratory instruments, are sometimes portable, weatherproof units with self-contained power supplies.

Medium A medium is a specific environment -- air, water, or soil -- which is the subject of regulatory concern and activities.

Mercury Mercury is a heavy metal that can accumulate in the environment and is highly toxic if breathed or swallowed. Mercury is found in thermometers, measuring devices, pharmaceutical and agricultural chemicals, chemical manufacturing, and electrical equipment. See also Heavy Metal.

Mercury Vapor Analyzer A mercury vapor analyzer is an instrument that provides real-time measurements of concentrations of mercury in the air.

Methane Methane is a colorless, nonpoisonous, flammable gas created by anaerobic decomposition of organic compounds.

Migration Pathway A migration pathway is a potential path or route of contaminants from the source of contamination to contact with human populations or the environment. Migration pathways include air, surface water, groundwater, and land surface. The existence and identification of all potential migration pathways must be considered during assessment and characterization of a waste site.

Mixed Waste Mixed waste is low-level radioactive waste contaminated with hazardous waste that is regulated under the Resource Conservation and Recovery Act (RCRA). Mixed waste can be disposed only in compliance with the requirements under RCRA that govern disposal of hazardous waste and with the RCRA land disposal restrictions, which require that waste be treated before it is disposed of in appropriate landfills.

Monitoring Well A monitoring well is a well drilled at a specific location on or off a hazardous waste site at which groundwater can be sampled at selected depths and studied to determine the direction of groundwater flow and the types and quantities of contaminants present in the groundwater.

National Pollutant Discharge Elimination System (NPDES)

NPDES is the primary permitting program under the Clean Water Act, which regulates all discharges to surface water. It prohibits discharge of pollutants into waters of the United States unless EPA, a state, or a tribal government issues a special permit to do so.

National Priorities List (NPL) The NPL is EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term cleanup under Superfund. Inclusion of a site on the list is based primarily on the score the site receives under the Hazard Ranking System (HRS). Money from Superfund can be used for cleanup only at sites that are on the NPL. EPA is required to update the NPL at least once a year.

Natural Attenuation Natural attenuation is an approach to cleanup that uses natural processes to contain the spread of contamination from chemical spills and reduce the concentrations and amounts of pollutants in contaminated soil and groundwater. Natural subsurface processes, such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials, reduce concentrations of contaminants to acceptable levels. An in situ treatment method that leaves the contaminants in place while those processes occur, natural attenuation is being used to clean up petroleum contamination from leaking underground storage tanks (LUST) across the country.

Non-Point Source The term non-point source is used to identify sources of pollution that are diffuse and do not have a point of origin or that are not introduced into a receiving stream from a specific outlet. Common non-point sources are rain water, runoff from agricultural lands, industrial sites, parking lots, and timber operations, as well as escaping gases from pipes and fittings.

Operation and Maintenance (O&M) O&M refers to the activities conducted at a site, following remedial actions, to ensure that the cleanup methods are working properly. O&M activities are conducted to maintain the effectiveness of the cleanup and to ensure that no new threat to human health or the environment arises. O&M may include such activities as groundwater and air monitoring, inspection and maintenance of the treatment equipment remaining on site, and maintenance of any security measures or institutional controls.

Organic Chemical or Compound An organic chemical or compound is a substance produced by animals or plants that contains mainly carbon, hydrogen, and oxygen.

Permeability Permeability is a characteristic that represents a qualitative description of the relative ease with which rock, soil, or sediment will transmit a fluid (liquid or gas).

Pesticide A pesticide is a substance or mixture of substances intended to prevent or mitigate infestation by, or destroy or

repel, any pest. Pesticides can accumulate in the food chain and/or contaminate the environment if misused.

Phenols A phenol is one of a group of organic compounds that are byproducts of petroleum refining, tanning, and textile, dye, and resin manufacturing. Low concentrations of phenols cause taste and odor problems in water; higher concentrations may be harmful to human health or the environment.

Photoionization Detector (PID) A PID is a nondestructive detector, often used in conjunction with gas chromatography, that measures the change of signal as analytes are ionized by an ultraviolet lamp. The PID is also used to detect VOCs and petroleum hydrocarbons.

Phytoremediation Phytoremediation is an innovative treatment technology that uses plants and trees to clean up contaminated soil and water. Plants can break down, or degrade, organic pollutants or stabilize metal contaminants by acting as filters or traps. Phytoremediation can be used to clean up metals, pesticides, solvents, explosives, crude oil, polyaromatic hydrocarbons, and landfill leachates. Its use generally is limited to sites at which concentrations of contaminants are relatively low and contamination is found in shallow soils, streams, and groundwater.

Plasma High-Temperature Metals Recovery Plasma high-temperature metals recovery is a thermal treatment process that purges contaminants from solids and soils such as metal fumes and organic vapors. The vapors can be burned as fuel, and the metal fumes can be recovered and recycled. This innovative treatment technology is used to treat contaminated soil and groundwater.

Plume A plume is a visible or measurable emission or discharge of a contaminant from a given point of origin into any medium. The term also is used to refer to measurable and potentially harmful radiation leaking from a damaged reactor.

Point Source A point source is a stationary location or fixed facility from which pollutants are discharged or emitted; or any single, identifiable discharge point of pollution, such as a pipe, ditch, or smokestack.

Polychlorinated Biphenyl (PCB) PCBs are a group of toxic, persistent chemicals, produced by chlorination of biphenyl, that once were used in high voltage electrical transformers because they conducted heat well while being fire resistant and good electrical insulators. These contaminants typically are generated from metal degreasing, printed circuit board cleaning, gasoline, and wood preserving processes. Further sale or use of PCBs was banned in 1979.

Polyaromatic Hydrocarbon (PAH) A PAH is a chemical compound that contains more than one fused benzene ring. They are commonly found in petroleum fuels, coal products, and tar.

Pump and Treat Pump and treat is a general term used to describe cleanup methods that involve the pumping of groundwater to the surface for treatment. It is one of the most common methods of treating polluted aquifers and groundwater.

Radioactive Waste Radioactive waste is any waste that emits energy as rays, waves, or streams of energetic particles. Sources of such wastes include nuclear reactors, research institutions, and hospitals.

Radionuclide A radionuclide is a radioactive element characterized according to its atomic mass and atomic number, which can be artificial or naturally occurring. Radionuclides have a long life as soil or water pollutants. Radionuclides cannot be destroyed or degraded; therefore, applicable technologies involve separation, concentration and volume reduction, immobilization, or vitrification. See also Solidification and Stabilization.

Radon Radon is a colorless, naturally occurring, radioactive, inert gaseous element formed by radioactive decay of radium atoms. See also Radioactive Waste and Radionuclide.

Release A release is any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, leaching, dumping, or disposing into the environment of a hazardous or toxic chemical or extremely hazardous substance, as defined under RCRA. See also Resource Conservation and Recovery Act.

Resource Conservation and Recovery Act (RCRA) RCRA is a Federal law enacted in 1976 that established a regulatory system to track hazardous substances from their generation to their disposal. The law requires the use of safe and secure procedures in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent the creation of new, uncontrolled hazardous waste sites.

Risk Communication Risk communication, the exchange of information about health or environmental risks among risk assessors, risk managers, the local community, news media and interest groups, is the process of informing members of the local community about environmental risks associated with a site and the steps that are being taken to manage those risks.

Saturated Zone The saturated zone is the area beneath the surface of the land in which all openings are filled with water at greater than atmospheric pressure.

Seismic Reflection and Refraction Seismic reflection and refraction is a technology used to examine the geophysical features of soil and bedrock, such as debris, buried channels, and other features.

Semi-Volatile Organic Compound (SVOC) SVOCs, composed primarily of carbon and hydrogen atoms, have boiling points greater than 200• C. Common SVOCs include PCBs and phenol. See also Polychlorinated Biphenyl.

Site Assessment A site assessment is an initial environmental investigation that is limited to a historical records search to determine ownership of a site and to identify the kinds of chemical processes that were carried out at the site. A site assessment includes a site visit, but does not include any sampling. If such an assessment identifies no significant concerns, a site investigation is not necessary.

Site Investigation A site investigation is an investigation that includes tests performed at the site to confirm the location and identity environmental hazards. The assessment includes preparation of a report that includes recommendations for cleanup alternatives.

Sludge Sludge is a semisolid residue from air or water treatment processes. Residues from treatment of metal wastes and the mixture of waste and soil at the bottom of a waste lagoon are examples of sludge, which can be a hazardous waste.

Slurry-Phase Bioremediation Slurry-phase bio-remediation, a treatment technology that can be used alone or in conjunction with other biological, chemical, and physical treatments, is a process through which organic contaminants are converted to innocuous compounds. Slurry-phase bioremediation can be effective in treating various semi-volatile organic carbons (SVOCs) and nonvolatile organic compounds, as well as fuels, creosote, pentachlorophenols (PCP), and PCBs. See also Polychlorinated Biphenyl and Semi-Volatile Organic Carbon.

Soil Boring Soil boring is a process by which a soil sample is extracted from the ground for chemical, biological, and analytical testing to determine the level of contamination present.

Soil Gas Soil gas consists of gaseous elements and compounds that occur in the small spaces between particles of the earth and soil. Such gases can move through or leave the soil or rock, depending on changes in pressure.

Soil Washing Soil washing is an innovative treatment technology that uses liquids (usually water, sometimes combined with chemical additives) and a mechanical process to scrub soils, removes hazardous contaminants, and concentrates the contaminants into a smaller volume. The technology is used to treat a wide range of contaminants, such as metals, gasoline, fuel oils, and pesticides. Soil washing is a relatively low-cost alternative for separating waste and minimizing volume as necessary to facilitate subsequent treatment. It is often used in combination with other treatment technologies. The technology can be brought to the site, thereby eliminating the need to transport hazardous wastes.

Solidification and Stabilization Solidification and stabilization are the processes of removing wastewater from a waste or changing it chemically to make the waste less

permeable and susceptible to transport by water. Solidification and stabilization technologies can immobilize many heavy metals, certain radionuclides, and selected organic compounds, while decreasing the surface area and permeability of many types of sludge, contaminated soils, and solid wastes.

Solvent A solvent is a substance, usually liquid, that is capable of dissolving or dispersing one or more other substances.

Solvent Extraction Solvent extraction is an innovative treatment technology that uses a solvent to separate or remove hazardous organic contaminants from oily-type wastes, soils, sludges, and sediments. The technology does not destroy contaminants, but concentrates them so they can be recycled or destroyed more easily by another technology. Solvent extraction has been shown to be effective in treating sediments, sludges, and soils that contain primarily organic contaminants, such as PCBs, VOCs, halogenated organic compounds, and petroleum wastes. Such contaminants typically are generated from metal degreasing, printed circuit board cleaning, gasoline, and wood preserving processes. Solvent extraction is a transportable technology that can be brought to the site. See also Polychlorinated Biphenyl and Volatile Organic Compound.

Surfactant Flushing Surfactant flushing is an innovative treatment technology used to treat contaminated groundwater. Surfactant flushing of NAPLs increases the solubility and mobility of the contaminants in water so that the NAPLs can be biodegraded more easily in an aquifer or recovered for treatment aboveground.

Surface Water Surface water is all water naturally open to the atmosphere, such as rivers, lakes, reservoirs, streams, and seas.

Superfund Superfund is the trust fund that provides for the cleanup of significantly hazardous substances released into the environment, regardless of fault. The Superfund was established under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and subsequent amendments to CERCLA. The term Superfund is also used to refer to cleanup programs designed and conducted under CERCLA and its subsequent amendments.

Superfund Amendment and Reauthorization Act (SARA) SARA is the 1986 act amending Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) that increased the size of the Superfund trust fund and established a preference for the development and use of permanent remedies, and provided new enforcement and settlement tools.

Thermal Desorption Thermal desorption is an innovative treatment technology that heats soils contaminated with hazardous wastes to temperatures from 200• F to 1,000• F so that contaminants that have low boiling points will vaporize and separate from the soil. The vaporized contaminants are then

collected for further treatment or destruction, typically by an air emissions treatment system. The technology is most effective at treating VOCs, SVOCs and other organic contaminants, such as PCBs, polyaromatic hydrocarbons (PAHs), and pesticides. It is effective in separating organics from refining wastes, coal tar wastes, waste from wood treatment, and paint wastes. It also can separate solvents, pesticides, PCBs, dioxins, and fuel oils from contaminated soil. See also Polyaromatic Hydrocarbon, Polychlorinated Biphenyl, Semivolatile Organic Compound, and Volatile Organic Compound.

Total Petroleum Hydrocarbon (TPH) TPH refers to a measure of concentration or mass of petroleum hydrocarbon constituents present in a given amount of air, soil, or water.

Toxicity Toxicity is a quantification of the degree of danger posed by a substance to animal or plant life.

Toxicity Characteristic Leaching Procedure (TCLP) The TCLP is a testing procedure used to identify the toxicity of wastes and is the most commonly used test for determining the degree of mobilization offered by a solidification and stabilization process. Under this procedure, a waste is subjected to a process designed to model the leaching effects that would occur if the waste was disposed of in a RCRA Subtitle D municipal landfill. See also Solidification and Stabilization.

Toxic Substance A toxic substance is a chemical or mixture that may present an unreasonable risk of injury to health or the environment.

Treatment Wall (also Passive Treatment Wall) A treatment wall is a structure installed underground to treat contaminated groundwater found at hazardous waste sites. Treatment walls, also called passive treatment walls, are put in place by constructing a giant trench across the flow path of contaminated groundwater and filling the trench with one of a variety of materials carefully selected for the ability to clean up specific types of contaminants. As the contaminated groundwater passes through the treatment wall, the contaminants are trapped by the treatment wall or transformed into harmless substances that flow out of the wall. The major advantage of using treatment walls is that they are passive systems that treat the contaminants in place so the property can be put to productive use while it is being cleaned up. Treatment walls are useful at some sites contaminated with chlorinated solvents, metals, or radioactive contaminants.

Underground Storage Tank (UST) A UST is a tank located entirely or partially underground that is designed to hold gasoline or other petroleum products or chemical solutions.

Unsaturated Zone The unsaturated zone is the area between the land surface and the uppermost aquifer (or saturated zone). The soils in an unsaturated zone may contain air and water.

Vadose Zone The vadose zone is the area between the surface of the land and the aquifer water table in which the moisture content is less than the saturation point and the pressure is less than atmospheric. The openings (pore spaces) also typically contain air or other gases.

Vapor Vapor is the gaseous phase of any substance that is liquid or solid at atmospheric temperatures and pressures. Steam is an example of a vapor.

Volatile Organic Compound (VOC) A VOC is one of a group of carbon-containing compounds that evaporate readily at room temperature. Examples of volatile organic compounds include trichloroethane, trichloroethylene, benzene, toluene, ethylbenzene, and xylene (BTEX). These contaminants typically are generated from metal degreasing, printed circuit board cleaning, gasoline, and wood preserving processes.

Volatilization Volatilization is the process of transfer of a chemical from the aqueous or liquid phase to the gas phase. Solubility, molecular weight, and vapor pressure of the liquid and the nature of the gas- liquid affect the rate of volatilization.

Voluntary Cleanup Program (VCP) A VCP is a formal means established by many states to facilitate assessment, cleanup, and redevelopment of brownfields sites. VCPs typically address the identification and cleanup of potentially contaminated sites that are not on the National Priorities List (NPL). Under VCPs, owners or developers of a site are encouraged to approach the state voluntarily to work out a process by which the site can be readied for development. Many state VCPs provide technical assistance, liability assurances, and funding support for such efforts.

Wastewater Wastewater is spent or used water from an individual home, a community, a farm, or an industry that contains dissolved or suspended matter.

Water Table A water table is the boundary between the saturated and unsaturated zones beneath the surface of the earth, the level of groundwater, and generally is the level to which water will rise in a well. See also Aquifer and Groundwater.

X-Ray Fluorescence Analyzer An x-ray fluorescence analyzer is a self-contained, field-portable instrument, consisting of an energy dispersive x-ray source, a detector, and a data processing system that detects and quantifies individual metals or groups of metals.